# MONTHLY WEATHER REVIEW

VOLUME 86

1958



U.S. DEPARTMENT OF COMMERCE · WEATHER BUREAU

# REGULAR MONTHLY WEATHER SURVEY

Charts I-III and VI-XVII in each issue of the Review, January to December, inclusive;

Charts IV and V, A and B, in each issue January-March and November-December, inclusive:

Chart I. A. Average Temperature at Surface. B. Departure of Average Temperature from the Normal.

Ab

An

AL

An

An

AN

AN

An

An

An

Ant

App

App

An

Chart II. Total Precipitation.

Chart III. A. Departure of Precipitation from Normal. B. Percentage of Normal Precipitation.

Chart IV. Total Snowfall.

Chart V. A. Percentage of Normal Snowfall. B. Depth of Snow on Ground.

Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset. B. Percentage of Normal Sky Cover Between Sunrise and Sunset.

Chart VII. A. Percentage of Possible Sunshine. B. Percentage of Normal Sunshine.

Chart VIII. Average Daily Values of Solar Radiation and Percentage of Normal.

Chart IX. Tracks of Centers of Anticyclones at Sea Level.

Chart X. Tracks of Centers of Cyclones at Sea Level.

Chart XI. Average Sea Level Pressure and Surface Windroses. Departure of Average Pressure from Normal.

Chart XII. 850-mb. Surface, 0300 gmr. Average Height and Temperature, and Resultant Winds.

Chart XIII. 700-mb. Surface, 0300 GMT. Average Height and Temperature, and Resultant Winds.

Chart XIV. 500-mb. Surface, 0300 GMT. Average Height and Temperature, and Resultant Winds.

Chart XV. 300-mb. Surface, 0300 GMT. Average Height and Temperature, and Resultant Winds.

Chart XVI. 200-mb. Surface, 0300 GMT. Average Height and Temperature, and Resultant Winds.

Chart XVII. 100-mb. Surface, 0300 GMT. Average Height and Temperature, and Resultant Winds.

In addition to Charts I-XVII the survey consists of two monthly articles:

1. A discussion of the month's weather, including an interpretation of Charts I-XVII in relation to mean circulation patterns of the Northern Hemisphere.

2. A discussion of an outstanding weather situation of the month, including an analysis and interpretation of the meteorological features shown by synoptic weather charts.

#### NOTICE

The Weather Bureau desires that the Monthly Weather Review shall be a medium of publication for contributions within the field, but such publication is not to be construed as official approval of the views expressed.

#### CORRECTIONS

Volume 86:

p. 133 In the caption the time of figure 1B should be 1200 GMT, May 27, 1958.

p. 253: In the second equation in column one,  $b_1$  should read  $\sqrt{b_1}$ .

# SUBJECT AND AUTHOR INDEX OF THE MONTHLY WEATHER REVIEW, 1958, VOL. 86

### A

Abnormally mild temperatures in the Canadian Arctic during January 1958. (2 figs.) M. K. Thomas and R. L. Titus. 19-22.

An abrupt change in stratospheric circulation beginning in mid-January 1958. (8 figs.) Sidney Teweles and Frederick G. Finger. 23-28.

ALLEN, R. A.:

and J. M. Sassman. Forecasting precipitation occurrence from prognostic charts of vertical velocity. (4 figs.) 95-99.

Analysis aids for the American Tropics. (15 figs.) L. F. Hubert. 201–218.

An analysis of routine 300-mb. transosonde flights from Japan. (8 figs.) J. K. Angell. 335-343.

ANDREWS, JAMES F .:

The weather and circulation of May 1958—Reversal from a long-period regime. (10 figs.) 177-185.

The weather and circulation of October 1958—A month characterized by a pronounced index cycle. (10 figs.) 408–415.

ANGELL, J. K.:

An analysis of routine 300-mb. transosonde flights from Japan. (8 figs.) 335-343.

Anomalous temperatures over the Rocky Mountain States, October 18-22, 1958. (13 figs.) Clarence L. Kibler and Marvin R. Rogers. 416-422.

Anomalous warming of the stratosphere over North America in early 1957. (25 figs.) Sidney Teweles. 377-396.

Antarctica:

An estimate of the minimum possible surface temperature at the South Pole. (3 figs.) R. A. McCormick. 1-5.

World record low temperature. [Weather Note] 236, 308.

Anticyclones:

Geographical frequency of troughs and ridges on mean 700-mb. charts. (48 figs.) William H. Klein and Jay S. Winston. 344-358.

Application of numerical methods to extended forecasting practices in the U.S. Weather Bureau. (11 figs.) Jerome Namias and Collaborators. 467–476.

Application of radiation data to maximum temperature forecasting. (17 figs.) Vance A. Myers. 149-164.

Application of the heat balance approach to maximum temperature forecasting. (5 figs.) Theodore W. Kleinsasser and Russell J. Younkin. 165–170.

An approximation formula to compute relative humidity from dry bulb and dew point temperatures. (1 fig.) Julius F. Bosen. 486.

Arctic:

Abnormally mild temperatures in the Canadian Arctic during January 1958. (2 figs.) M. K. Thomas and R. L. Titus. 19-22.

ARNETT, JOHN S.:

Principal tracks of Southern Hemisphere extratropical cyclones. (3 figs.) 41-44.

Automatic incorporation of numerical short-range prognoses in 5-day circulation forecasts. (3 figs.) Carlos R. Dunn. 45-52.

B

BALLENZWEIG, E. M.:

The weather and circulation of September 1958. (7 figs.) 359-367.

Barotropic divergence and very long atmospheric waves. (4 figs.) George P. Cressman. 285–292.

Behavior of two east coast storms, March 13-24, 1958. (4 figs.) Alan N. Sanderson and Ralph B. Mason, Jr. 109-115.

The birthplace of North Atlantic tropical storms. (11 figs.) William H. Haggard. 397-404.

BOSEN, JULIUS F .:

An approximation formula to compute relative humidity from dry bulb and dew point temperatures. (1 fig.) 486.

BRIER, GLENN W .:

and Dwight B. Kline. A note on freezing nuclei anomalies. (2 figs.) 329-333.

BRISTOR, CHARLES L.:

Effect of data coverage on the accuracy of 500-mb. forecasts. (11 figs.) 299-308.

BUCCI, ANDREW:

and Robert H. Martin. A comparison of two redeveloping Texas lows, January 1958. (8 figs.) 29-40.

C

Canada:

Abnormally mild temperatures in the Canadian Arctic during January 1958. (2 figs.) M. K. Thomas and R. L. Titus. 19-22.

Lowest temperature in Canada. [Correspondence] Andrew Thomson. 298.

CAPORASO, ROCCO J .:

and Harlan K. Saylor. Development of a largeamplitude 500-mb. trough in western United States and associated surface cyclogenesis, November 13-18, 1958. (7 figs.) 447-456.

CAVE, C. L.

and W. E. Hubert and P. M. Wolff. A comparison of JNWP trajectory forecasts with transosonde flights. (11 figs.) 53-59.

CHAMBERLAIN, LLOYD W .:

and Robert O. Cole. Vertical wind shears near the core of the jet stream over the eastern United States, August 1-2, 1958. (6 figs.) 319-327.

CLAPP, PHILIP F .:

Comments on "The error in numerical forecasts due to retrogression of ultra-long waves." [Correspondence] 298, 327-328.

CLARK, JOHN R.:

and William O. French. Some interesting aspects of a subtropical depression, May 18-28, 1958. (12 figs.) 186-196.

A classic example of rapid cyclogenesis in the Midwest, February 25-28, 1958. (8 figs.) Harold J. Shellum and Gordon C. Tait. 71-79.

Climatological analysis of freeze data for Iowa. (4 figs). H. C. S. Thom and R. H. Shaw. 251-257.

Climatology:

Climatological analysis of freeze data for Iowa. (4 figs.) H. C. S. Thom and R. H. Shaw. 251–257.

Geographical frequency of troughs and ridges on mean 700-mb. charts. (48 figs.) William H. Klein and Jay S. Winston. 344-358.

Tornadoes in the United States, 1950-1956. (20 figs.) J. T. Lee. 219-228.

The cold low over southeastern United States, July 1-6, 1958. (7 figs.) Edmund DiLoreto and Masaru Hamada. 277-283.

COLE, ROBERT O .:

and Lloyd W. Chamberlain. Vertical wind shears near the core of the jet stream over the north-eastern United States, August 1-2, 1958. (6 figs.) 319-327.

Comments on "Cyclogenesis and precipitation in the blizzard of March 21-26, 1957." [Correspondence] Lawrence A. Hughes. 265-267.

Comments on "Some interesting aspects of a subtropical depression, May 18-28, 1958." (1 fig.) [Correspondence] Eugene W. Hoover. 333-334.

Comments on "The error in numerical forecasts due to retrogression of ultra-long waves." [Correspondence] Philip F. Clapp. 298, 327–328.

A comparison of JNWP trajectory forecasts with transosonde flights. (11 figs.) W. E. Hubert, P. M. Wolff, and C. L. Cave. 53-59.

A comparison of two redeveloping Texas lows, January 1958. (8 figs.) Robert H. Martin and Andrew Bucci. 29-40.

COOK, BILLIE J .:

Hail determination by radar analysis. (4 figs.)

CRESSMAN, GEORGE P .:

Barotropic divergence and very long atmospheric waves. (4 figs.) 285-292.

Cyclones:

Behavior of two east coast storms, March 13-24, 1958. (4 figs.) Alan N. Sanderson and Ralph B. Mason, Jr. 109-115. DU

Eff

Eff

Eq

Th

An

Est

Eva

FIN

Flo

For

For

For

A classic example of rapid cyclogenesis in the Midwest, February 25–28, 1958. (8 figs.) Harold J. Shellum and Gordon C. Tait 71–79.

The cold low over southeastern United States, July 1-6, 1958. (7 figs.) Edmund DiLoreto and Masaru Hamada. 277-283.

Comments on "Cyclogenesis and precipitation in the blizzard of March 21-26, 1957." [Correspondence] Lawrence A. Hughes. 265-267.

Comments on "Some interesting aspects of a subtropical depression, May 18-28, 1958." (1 fig.) [Correspondence] Eugene W. Hoover. 333-334.

A comparison of two redeveloping Texas lows, January 1958. (8 figs.) Robert H. Martin and Andrew Bucci. 29-40.

Geographical frequency of troughs and ridges on mean 700-mb. charts. (48 figs.) William H. Klein and Jay S. Winston. 344-358.

Principal tracks of Southern Hemisphere extratropical cyclones. (3 figs.) John S. Arnett. 41-44.

Rapid cyclogenesis over the Great Basin, April 22-23, 1958. (6 figs.) Robert F. Shaw and Ellis J. Joseph. 141-146.

Some interesting aspects of a subtropical depression, May 18-28, 1958. (12 figs.) John R. Clark and William O. French. 186-196.

D

DAHL, ROY A .:

and Donald A. Richter. Relationship of heavy precipitation to the jet maximum in the eastern United States, September 19-21, 1958. (10 figs.) 368-376.

Density, Atmospheric:

Estimating the variance of density at constant height from constant pressure data. (1 fig.) Conrad P. Mook. 309-311.

Description of charts. 80, 147-148, 244, 424.

Development of a large-amplitude 500-mb. trough in western United States and associated surface cyclogenesis, November 13–18, 1958. (7 figs.) Harlan K. Saylor and Rocco J. Caporaso. 447–456.

DILORETO, EDMUND:

and Masaru Hamada. The cold low over southeastern United States, July 1-6, 1958. (7 figs.) 277-283.

DUNN, CARLOS R.

Automatic incorporation of numerical short-range prognoses in 5-day circulation forecasts. (3 figs.) 45-52.

DUNN, CARLOS R .- continued

The weather and circulation of July 1958—Heavy precipitation associated with a trough in central United States. (11 figs.) 268-276.

#### E

Effect of data coverage on the accuracy of 500-mb. forecasts. (11 figs.) Charles L. Bristor. 299-308.

Effect of the state of the ground on the local heat balance. (1 fig.) G. Daniel Hembree. 171-176.

Equations of Motion:

d-

er.

78,

H.

The lattice structure of the finite-difference primitive and vorticity equations. (4 figs.) George W. Platzman. 285-292.

On the numerical integration of the primitive equations of motion for baroclinic flow in a closed region. J. Smagorinsky. 457-466.

The error in numerical forecasts due to retrogression of ultra-long waves. (10 figs.) Paul M. Wolff. 245-250.

An estimate of the minimum possible surface temperature at the South Pole. (3 figs.) R. A. McCormick. 1-5.

Estimating the variance of density at constant height from constant pressure data. (1 fig.) Conrad P. Mook. 309-311.

Evapotranspiration:

A graphical technique for determining evapotranspiration by the Thornthwaite method. (4 figs.)
Wayne C. Palmer and A. Vaughn Havens.
123-128.

#### H

FINGER, FREDERICK G .:

and Sidney Teweles. An abrupt change in stratospheric circulation beginning in mid-January 1958. (8 figs.) 23-28.

Florida:

n

Rainfall rates in Florida hurricanes. (8 figs.) Banner I. Miller. 258-264.

Forecasting precipitation occurrence from prognostic charts of vertical velocity. (4 figs.) R. A. Allen and J. M. Sassman. 95–99.

Forecasting strong winter winds over Puerto Rico and the Virgin Islands. (9 figs.) Harry M. Hoose and Robert Levine. 425-434.

Forecasting:

Anomalous temperatures over the Rocky Mountain States, October 18–22, 1958. (13 figs.) Clarence L. Kibler and Marvin R. Rogers. 416–422.

Application of radiation data to maximum temperature forecasting. (17 figs.) Vance A. Myers. 149-164.

Application of the heat balance approach to maximum temperature forecasting. (5 figs.) Theodore W. Kleinsasser and Russell J. Younkin. 165-170.

Forecasting-Continued

Comments on "Some interesting aspects of a subtropical depression, May 18-28, 1958." (1 fig.) [Correspondence] Eugene W. Hoover. 333-334.

A comparison of JNWP trajectory forecasts with transosonde flights. (11 figs.) W. E. Hubert, P. M. Wolff, and C. L. Cave. 53-59.

Effect of data coverage on the accuracy of 500-mb. forecasts. (11 figs.) Charles L. Bristor. 299-308.

Forecasting precipitation occurrence from prognostic charts of vertical velocity. (4 figs.) R. A. Allen and J. M. Sassman. 95–99.

Forecasting strong winter winds over Puerto Rico and the Virgin Islands. (9 figs.) Harry M. Hoose and Robert Levine. 425-434.

Forecasting, Numerical:

Application of numerical methods to extended forecasting practices in the U.S. Weather Bureau. (11 figs.) Jerome Namias and Collaborators. 467-476.

Automatic incorporation of numerical short-range prognoses in 5-day circulation forecasts. (3 figs). Carlos R. Dunn. 45-52.

Barotropic divergence and very long atmospheric waves. (4 figs.) George P. Cressman. 285-292.

Comments on "The error in numerical forecasts due to retrogression of ultra-long waves." [Correspondence] Philip F. Clapp. 298, 327-328.

The error in numerical forecasts due to retrogression of ultra-long waves. (10 figs.) Paul M. Wolff. 245-250.

FOSTER, DONALD S .:

Thunderstorm gusts compared with computed downdraft speeds. (4 figs.) 91-94.

Freezing nuclei:

A note on freezing nuclei anomalies. (2 figs.) Dwight B. Kline and Glenn W. Brier. 329-333.

FRENCH, WILLIAM O .:

and John R. Clark. Some interesting aspects of a subtropical depression, May 18–28, 1958. (12 figs.) 186–196.

FRITZ, SIGMUND:

Radiational inversions and surface temperature changes. (2 figs.) 129-131.

Further tests of operational mesoanalysis. [Correspondence] Bernard W. Magor. 116

#### G

Geographical frequency of troughs and ridges on mean 700-mb. charts. (48 figs.) William H. Klein and Jay S. Winston. 344-358.

A graphical technique for determining evapotranspiration by the Thornthwaite method. (4 figs.) Wayne C. Palmer and A. Vaughn Havens. 123-128. GREEN, RAYMOND A .:

The weather and circulation of March 1958. (10 figs.) 100-106.

The weather and circulation of December 1958. (6 figs.) 487-492.

Greenland:

Lowest temperature in Greenland. [Correspondence] Roderick S. Quiroz. 99.

#### H

HAGGARD, WILLIAM H .:

The birthplace of North Atlantic tropical storms. (11 figs.) 397-404.

Hail determination by radar analysis. (4 figs.) Billie J. Cook. 435–438.

HAMADA, MASARU:

and Edmund DiLoreto. The cold low over southeastern United States, July 1-6, 1958. (7 figs.) 277-283.

HAVENS, A. VAUGHN:

and Wayne C. Palmer. A graphical technique for determining evapotranspiration by the Thorn-thwaite method. (4 figs.) 123-128.

Heat balance:

Application of radiation data to maximum temperature forecasting. (17 figs.) Vance A. Myers. 149-164.

Application of the heat balance approach to maximum temperature forecasting. (5 figs.) Theodore W. Kleinsasser and Russell J. Younkin. 165–170.

Effect of the state of the ground on the local heat balance. (1 fig.) G. Daniel Hembree. 171-176.

HEMBREE, G. DANIEL:

Effect of the state of the ground on the local heat balance. (1 fig.) 171-176.

HOOSE, HARRY M.

and Robert Levine. Forecasting strong winter winds over Puerto Rico and the Virgin Islands. (9 figs.) 425-434.

HOOVER, EUGENE W .:

Comments on "Some interesting aspects of a subtropical depression, May 18–28, 1958." (1 fig.) [Correspondence] 333–334.

HUBERT, L. F.:

Analysis aids for the American Tropics. (15 figs.) 201–218.

HUBERT, W. E.:

and P. M. Wolff and C. L. Cave. A comparison of JNWP trajectory forecasts with transosonde flights. (11 figs.) 53-59.

HUGHES, LAWRENCE A .:

Comments on "Cyclogenesis and precipitation in the blizzard of March 21-26, 1957." [Correspondence] 265-267.

The hurricane season of 1958. (7 figs.) Staff, Weather Bureau Office, Miami, Fla. 477-485.

Hurricanes (see also Tropical Storms):

The birthplace of North Atlantic tropical storms (11 figs.) William H. Haggard. 397-404.

The hurricane season of 1958. (7 figs.) Staff Weather Bureau Office, Miami, Fla. 477-485

Rainfall rates in Florida hurricanes. (8 figs.) Banner I. Miller. 258-264.

The weather and circulation of September 1958. (7 figs.) E. M. Ballenzweig. 359-367.

The weather and circulation of October 1958—A month characterized by a pronounced index cycle (10 figs.) James F. Andrews. 408–415.

#### I

Iowa:

Climatological analysis of freeze data for Iowa. (4 figs.) H. C. S. Thom and R. H. Shaw. 251-257.

#### I

JORDAN, HAROLD M .:

and Dale A. Lowry. Late-season cold outbreak June 24-27, 1958. (9 figs.) 237-243.

JOSEPH, ELLIS J.:

and Robert F. Shaw. Rapid cyclogenesis over the Great Basin, April 22-23, 1958. (6 figs.) 141-146.

# K

KIBLER, CLARENCE L .:

and Marvin R. Rogers. Anomalous temperature over the Rocky Mountain States, October 18-22, 1958. (13 figs.) 416-422.

KLEIN, WILLIAM H .:

The weather and circulation of February 1958—1 month with an expanded circumpolar vortex of record intensity. (10 figs.) 60-70.

A

MI

MC

MY

NA

and Jay S. Winston. Geographical frequency of troughs and ridges on mean 700-mb. charts (48 figs.) 344-358.

KLEINSASSER, THEODORE W.:

and Russell J. Younkin. Application of the heat balance approach to maximum temperature forecasting. (5 figs.) 165-170.

KLINE, DWIGHT B .:

and Glenn W. Brier. A note on freezing nuclei anomalies. (2 figs.) 329-333.

#### L

Late-season cold outbreak, June 24–27, 1958. (9 figs. Harold M. Jordon and Dale A. Lowry. 237–243.

The lattice structure of the finite-difference primitive and vorticity equations. (4 figs.) George W. Platzman 285-292.

LEE, J. T.:

Tornadoes in the United States, 1950-1956. (1) figs.) 219-228.

LEVINE, ROBERT:

rms.

taff.

485

Ban.

958.

ycle.

-257.

reak

the

141-

ture

3-22

8-1

ex of

y of

arts

heat

fore

nuclei

figs.

e and

man

and Harry M. Hoose. Forecasting strong winter winds over Puerto Rico and the Virgin Islands. (9 figs.) 425-434.

Lowest temperature in Canada. [Correspondence] Andrew Thomson. 298.

Lowest temperature in Greenland. [Correspondence] Roderick S. Quiroz. 99.

LOWRY, DALE A .:

and Harold M. Jordan. Late-season cold outbreak, June 24-27, 1958. (9 figs.) 237-243.

# M

MAGOR, BERNARD W .:

Further tests of operational mesoanalysis. [Correspondence] 116.

A meso-Low associated with a severe storm. (10 figs.) 81-90.

MARTIN, ROBERT H.

and Andrew Bucci. A comparison of two redeveloping Texas lows, January 1958. (8 figs.) 29-40. MASON, RALPH B., JR.:

and Alan N. Sanderson. Behavior of two east coast storms, March 13-24, 1958. (4 figs.) 109-115.

MCCORMICK, R.A.:

An estimate of the minimum possible surface temperature at the South Pole. (3 figs.) 1-5.

Mesoanalysis:

Further tests of operational mesoanalysis. [Correspondence] Bernard W. Magor. 116.

A meso-Low associated with a severe storm. (10 figs.) Bernard W. Magor. 81–90.

A meso-Low associated with a severe storm. (10 figs.) Bernard W. Magor. 81–90.

A method for forecasting the maximum surge at Boston due to extratropical storms. (3 figs.) Anthony E. Tancreto. 197-200.

MILLER, BANNER I .:

Rainfall rates in Florida hurricanes. (8 figs). 258-264.

MOOK, CONRAD P .:

Estimating the variance of density at constant height from constant pressure data. (1 fig.) 309-311.

MYERS, VANCE A .:

Application of radiation data to maximum temperature forecasting. (17 figs.) 149-164.

#### N

NAMIAS, JEROME:

and Collaborators. Application of numerical methods to extended forecasting practices in the U.S. Weather Bureau. (11 figs.) 467-476.

A note on freezing nuclei anomalies. (2 figs.) Dwight B. Kline and Glenn W. Brier. 329-333.

A note on the gamma distribution. H.C.S. Thom. 117-

Observations:

Effect of data coverage on the accuracy of 500-mb. forecasts. (11 figs.) Charles L. Bristor. 299-308.

0

O'CONNOR, JAMES F .:

The weather and circulation of January 1958—Low index with record cold in southeastern United States. (8 figs.) 11-18.

The weather and circulation of June 1958—Record cold in the Northeast and warmth in the Northwest. (5 figs.) 229-236.

On the lowest temperatures on earth. (1 fig.) Nina A. Stepanova. 6-10.

On the numerical integration of the primitive equations of motion for baroclinic flow in a closed region. J. Smagorinsky. 457-466.

# P

PALMER, WAYNE C .:

and A. Vaughn Havens. A graphical technique for determining evapotranspiration by the Thornth-waite method. (4 figs.) 123-128.

PAROCZAY, ERNEST:

The weather and circulation of November 1958—A mid-month reversal of weather regimes. (6 figs.) 439–446.

PLATZMAN, GEORGE W .:

The lattice structure of the finite-difference primitive and vorticity equations. (4 figs.) 285-292.

Precipitation:

Comments on "Cyclogenesis and precipitation in the blizzard of March 21-26, 1957." [Correspondence] Lawrence A. Hughes. 265-267.

Forecasting precipitation occurrence from prognostic charts of vertical velocity. (4 figs.) R. A. Allen and J. M. Sassman. 95–99.

Rainfall rates in Florida hurricanes. (8 figs.) Banner I. Miller. 258–264.

Relationship of heavy precipitation to the jet maximum in the eastern United States, September 19-21, 1958. (10 figs.) Donald A. Richter and Roy A. Dahl. 368-376.

The weather and circulation of July 1958—Heavy precipitation associated with a trough in central United States. (11 figs.) Carlos R. Dunn. 268-276.

Principal tracks of Southern Hemisphere extratropical cyclones. (3 figs.) John S. Arnett. 41-44.

Puerto Rico:

Forecasting strong winter winds over Puerto Rico and the Virgin Islands. (9 figs.) Harry M. Hoose and Robert Levine. 425-434.

#### Q

QUIROZ, RODERICK S.:

Lowest temperature in Greenland. [Correspondence]

R

Radar observations of the El Dorado, Kans., tornado, June 10, 1958. (3 figs.) [Weather note] Alexander Sadowski. 405-407.

Radar:

Hail determination by radar analysis. (4 figs.) Billie J. Cook. 435–438.

Radar observations of the El Dorado, Kans. tornado, June 10, 1958. (3 figs.) [Weather note] Alexander Sadowski. 405-407.

Radiational inversions and surface temperature changes. (2 figs.) Sigmund Fritz. 129-131.

Rainfall rates in Florida hurricanes. (8 figs.) Banner I. Miller. 258–264.

Rapid cyclogenesis over the Great Basin, April 22–23, 1958. (6 figs.) Robert F. Shaw and Ellis J. Joseph. 141–146.

Relationship of heavy precipitation to the jet maximum in the eastern United States, September 19-21, 1958. (10 figs.) Donald A. Richter and Roy A. Dahl. 368-376.

Relative humidity:

An approximation formula to compute relative humidity from dry bulb and dew point temperatures. (1 fig.) Julius F. Bosen. 486.

RICHTER, DONALD A .:

and Roy A. Dahl. Relationship of heavy precipitation to the jet maximum in the eastern United States, September 19-21, 1958. (10 figs.) 368-376.

ROGERS, MARVIN R.:

and Clarence L. Kibler. Anomalous temperatures over the Rocky Mountain States, October 18-22, 1958. (13 figs.) 416-422.

S

SADOWSKI, ALEXANDER:

Radar observations of the El Dorado, Kans. tornado, June 10, 1958. [Weather note] 405-407.

SANDERSON, ALAN N.:

and Ralph B. Mason, Jr. Behavior of two east coast storms, March 13-24, 1958. (4 figs.) 109-115.

SASSMAN, J. M.:

and R. A. Allen. Forecasting precipitation occurrence from prognostic charts of vertical velocity. (4 figs.) 95-99.

SAYLOR, HARLAN K .:

and Rocco J. Caporaso. Development of a largeamplitude 500-mb. trough in western United States and associated surface cyclogenesis, November 13-18, 1958. (7 figs.) 447-456.

SHAW, R. H.:

and H. C. S. Thom. Climatological analysis of freeze data for Iowa. (4 figs.) 251–257.

SHAW, ROBERT F .:

and Ellis J. Joseph. Rapid cyclogenesis over the Great Basin, April 22-23, 1958. (6 figs.) 141-146.

SHELLUM, HAROLD J .:

and Gordon C. Tait. A classic example of rapid cyclogenesis in the Midwest, February 25-28, 1958. (8 figs.) 71-79.

SMAGORINSKY, J .:

On the numerical integration of the primitive equations of motion for baroclinic flow in a closed region. 457-466.

Solar radiation:

Application of radiation data to maximum temperature forecasting. (17 figs.) Vance A. Myers. 149-164.

Some interesting aspects of a subtropical depression, May 18-28, 1958. (12 figs.) John R. Clark and William O. French. 186-196.

Southern Hemisphere:

Principal tracks of Southern Hemisphere extratropical cyclones. (3 figs.) John S. Arnett. 41-44.

STARK, PAUL:

The weather and circulation of April 1958. (9 figs.) 132–140.

Statistical method:

A note on the gamma distribution. H. C. S. Thom. 117-122.

STEPANOVA, NINA A.:

On the lowest temperatures on earth. (1 fig.) 6-10.

Storm surge:

A method for forecasting the maximum surge at Boston due to extratropical storms. (3 figs.) Anthony E. Tancreto. 197–200.

Stratosphere:

An abrupt change in stratospheric circulation beginning in mid-January 1958. (8 figs.) Sidney Teweles and Frederick G. Finger. 23-28.

TH

TH

Th

Tic

TIT

Tor

To

Anomalous warming of the stratosphere over North America in early 1957. (25 figs.) Sidney Teweles. 377-396.

Suggestions for authors. 28, 284, 423.

T

TAIT, GORDON C .:

and Harold J. Shellum. A classic example of rapid cyclogenesis in the Midwest, February 25–28, 1958. (8 figs.) 71–79.

TANCRETO, ANTHONY E .:

A method for forecasting the maximum surge at Boston due to extratropical storms. (3 figs.) 197-200.

Temperature:

Abnormally mild temperatures in the Canadian Arctic during January 1958. (8 figs.) M. K. Thomas and R. L. Titus. 19-22.

Anomalous temperatures over the Rocky Mountain States, October 18–22, 1958. (13 figs.) Clarence L. Kibler and Marvin R. Rogers. 416–422.

Anomalous warming of the stratosphere over North America in early 1957. (25 figs.) S. Teweles. 377-396. Temperature—Continued

pid -28.

ua-

sed

era-

ers.

ion,

and

ical

gs.)

om.

-10.

2S.)

in-

ney

rth

ley

S.)

an

K.

in

th

Application of radiation data to maximum temperature forecasting. (17 figs.) Vance A. Myers. 149-164.

Application of the heat balance approach to maximum temperature forecasting. (5 figs.) Theodore W. Kleinsasser and Russell J. Younkin. 165-170.

Climatological analysis of freeze data for Iowa. (4 figs.) H. C. S. Thom and R. H. Shaw. 251-257.

An estimate of the minimum possible surface temperature at the South Pole. (3 figs.) R. A. McCormick. 1-5.

Lowest temperature in Canada. [Correspondence] Andrew Thomson. 298.

Lowest temperature in Greenland. [Correspondence] Roderick S. Quiroz. 99.

On the lowest temperature on earth. (1 fig.) Nins A. Stepanova. 6-10.

Radiational inversions and surface temperature changes. (2 figs.) Sigmund Fritz. 129–131.

World record low temperature. [Weather note] 236, 308.

TEWELES, SIDNEY:

Anomalous warming of the stratosphere over North America in early 1957. (25 figs.) 377-396.

and Frederick G. Finger. An abrupt change in stratospheric circulation beginning in mid-January 1958. (8 figs.) 23-28.

THOM, H. C. S .:

A note on the gamma distribution. 117-122.

and R. H. Shaw. Climatological analysis of freeze data for Iowa. (4 figs.) 251-257.

THOMAS, M. K .:

and R. L. Titus. Abnormally mild temperatures in the Canadian Arctic during January 1958. (2 figs.) 19-22.

THOMSON, ANDREW:

Lowest temperature in Canada. [Correspondence] 298.

Thunderstorm gusts compared with computed downdraft speeds. (4 figs.) Donald S. Foster. 91-94.

Tide forecasts:

A method for forecasting the maximum surge at Boston due to extratropical storms. (3 figs.) Anthony E. Tancreto. 197–200.

TITUS, R. L.:

and M. K. Thomas. Abnormally mild temperatures in the Canadian Arctic during January 1958. (2 figs.) 19-22.

Tornadoes in the United States, 1950-1956. (20 figs.) J. T. Lee. 219-228.

Tornadoes:

Radar observations of the El Dorado, Kans., tornado, June 10, 1958. [Weather note] Alexander Sadowski. 405-407.

Tornadoes—Continued

Tornadoes in the United States, 1950-1956. (20 figs.) J. T. Lee. 219-228.

Tropical meteorology:

Analysis aids for the American Tropics. (15 figs.) L. F. Hubert. 201-218.

Forecasting strong winter winds over Puerto Rico and the Virgin Islands. (9 figs.) Harry M. Hoose and Robert Levine. 425-434.

Tropical storms (see also Hurricanes):

The birthplace of North Atlantic tropical storms. (11 figs.) William H. Haggard. 397-404.

The hurricane season of 1958. (7 figs.) Staff, Weather Bureau Office, Miami, Fla. 477–485.

The weather and circulation of September 1958. (7 figs.) E. M. Ballenzweig. 359-367.

The weather and circulation of October 1958—A month characterized by a pronounced index cycle. (10 figs.) James F. Andrews. 408–415.

Typhoons:

The weather and circulation of September 1958. (7 figs.) E. M. Ballenzweig. 359-367.

The weather and circulation of October 1958—A month characterized by a pronounced index cycle. (10 figs.) James F. Andrews. 408-415.

# V

Vertical wind shears near the core of the jet stream over the eastern United States, August 1-2, 1958. (6 figs.) Robert O. Cole and Lloyd W. Chamberlain. 319-327.

#### W

Weather, U.S., 1958:

Anomalous temperatures over the Rocky Mountain States, October 18-22, 1958. (13 figs.) Clarence L. Kibler and Marvin R. Rogers. 416-422.

Behavior of two east coast storms, March 13-24, 1958. (4 figs.) Alan N. Sanderson and Ralph B. Mason, Jr. 109-115.

A classic example of rapid cyclogenesis in the Midwest, February 25–28, 1958. (8 figs.) Harold J. Shellum and Gordon C. Tait. 71–79.

The cold low over southeastern United States, July 1-6, 1958. (7 figs.) Edmund DiLoreto and Masaru Hamada. 277-283.

A comparison of two redeveloping Texas lows, January 1958. (8 figs.) Robert H. Martin and Andrew Bucci. 29-40.

Development of a large-amplitude 500-mb. trough in western United States and associated surface cyclogenesis, November 13–18, 1958. (7 figs.) Harlan K. Saylor and Rocco J. Caporaso. 447–456.

The hurricane season of 1958. (7 figs.) Staff, Weather Bureau Office, Miami, Fla. 477-485.

Late-season cold outbreak, June 24–28, 1958. (9 figs.) Harold M. Jordan and Dale A. Lowry. 237–243.

Weather, U.S., 1958-Continued

Rapid cyclogenesis over the Great Basin, April 22–23, 1958. (6 figs.) Robert F. Shaw and Ellis J. Joseph. 141–146.

Relationship of heavy precipitation to the jet maximum in the eastern United States, September 19-21, 1958. (10 figs.) Donald A. Richter and Roy A. Dahl. 368-376.

The weather and circulation of January 1958—Low index with record cold in southeastern United States. (8 figs.) James F. O'Connor. 11-18.

The weather and circulation of February 1958—A month with an expanded circumpolar vortex of record intensity. (10 figs.) William H. Klein. 60-70.

The weather and circulation of March 1958. (10 figs.) Raymond A. Green. 100-106.

The weather and circulation of April 1958. (9 figs.) Paul Stark. 132-140.

The weather and circulation of May 1958—Reversal from a long-period regime. (10 figs.) James F. Andrews. 177–185.

The weather and circulation of June 1958—Record cold in the Northeast and warmth in the Northwest. (5 figs.) James F. O'Connor. 229-236.

The weather and circulation of July 1958—Heavy precipitation associated with a trough in central United States. (11 figs.) Carlos R. Dunn. 268-276.

The weather and circulation of August 1958—A month with an unusual temperature reversal. (8 figs.) Charles M. Woffinden. 312-318.

The weather and circulation of September 1958. (7 figs.) E. M. Ballenzweig. 359-367.

The weather and circulation of October 1958—A month characterized by a pronounced index cycle. (10 figs.) James F. Andrews. 408–415.

The weather and circulation of November 1958—A mid-month reversal of weather regimes. (6 figs.) Ernest Paroczay. 439–446.

The weather and circulation of December 1958. (6 figs.) Raymond A. Green. 487-492.

Winds:

An analysis of routine 300-mb. transosonde flights from Japan. (8 figs.) J. K. Angell. 335-343.

A comparison of JNWP trajectory forecasts with transosonde flights. (11 figs.) W. E. Hubert, P. M. Wolff, and C. L. Cave. 53-59.

Forecasting strong winter winds over Puerto Rico and the Virgin Islands. (9 figs.) Harry M. Hoose and Robert Levine. 425-434.

Thunderstorm gusts compared with computed downdraft speeds. (4 figs.) Donald S. Foster. 91-94.

Winds, Jet Stream:

Relationship of heavy precipitation to the jet maximum in the eastern United States, September 19-21, 1958. (10 figs.) Donald A. Richter and Roy A. Dahl. 368-376.

Vertical wind shears near the core of the jet stream over the eastern United States, August 1-2, 1958, (6 figs.) Robert O. Cole and Lloyd W. Chamberlain. 319-327.

WINSTON, JAY 8 .:

and William H. Klein. Geographical frequency of troughs and ridges on mean 700-mb. charts. (48 figs.) 344-358.

WOFFINDEN, CHARLES M .:

The weather and circulation of August 1958—A month with an unusual temperature reversal. (8 figs.) 312-318.

WOLFF, PAUL M .:

The error in numerical forecasts due to retrogression of ultra-long waves. (10 figs.) 245-250.

and W. E. Hubert and C. L. Cave. A comparison of JNWP trajectory forecasts with transosonde flights. (11 figs.) 53-59.

World record low temperature. [Weather note] 236, 308.

Y

YOUNKIN, RUSSELL J.

and Theodore W. Kleinsasser. Application of the heat balance approach to maximum temperature forecasting. (5 figs.) 165-170.

